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**THE WEIGHT OF ECONOMIC AND
COMMERCIAL DIPLOMACY**

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Abstract

This paper investigates the impact of economic and commercial diplomacy on the geography of international trade. We replicate a recent study by Rose (2007) extending the analysis to include the year 2006 and 63 importing and exporting countries. Using a gravity model we are able to demonstrate that diplomatic representation via embassies and consulates is not a relevant trade enhancing factor for trade within the OECD. In contrast diplomatic representation is significant in bilateral trade relationships of developing countries as it both facilitates imports and stimulates exports. We discuss some implications of our findings for developing countries especially in view of South–South trade.

Keywords

Gravity model, development, south–south trade, diplomacy

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F19, F55, F59, O19, O24

THE WEIGHT OF ECONOMIC AND COMMERCIAL DIPLOMACY¹

1 INTRODUCTION

Ever since the first application of the gravity model of international trade by Tinbergen (1962), empirical trade analysts have acknowledged the need to take political factors into account when they were trying to explain the geography of international trade. In a data set that related to 1959, covered about 70% of world trade and comprised 42 countries (both developing nations and major OECD countries), Tinbergen estimated trade-stimulating preferential treatment to yield ‘colonial or ex-colonial’ trade multipliers of about ten, indicating that (ex) colonial ties gave rise to ten times the usual trade volume. The measurement of political factors in this seminal study admittedly was rather crude as it only used a binary variable. Interestingly, Tinbergen himself appears to have been a bit puzzled by the actual size of his ‘political’ trade multiplier.

While preferences based on colonial ties from the past have become weaker in the course of time (Bikker, 1987, p. 330), significance of political factors still is a consistent finding in recent alternative specifications and data sets (see Van Bergeijk 2009, especially Table 1.2, p. 6). Importantly, the result that political factors are very relevant for the volume and direction of trade flows was also found when the measurement of international relations was refined beyond the stage of crude dummy variables. Pollins (1989) combined political event observations with trade data testing the empirical relevance of incorporating a measure of diplomatic relations into a 25-nation gravity model of international trade for 16 annual cross-sectional estimations for the years 1960–1975. Summary (1989) developed a gravity-type model for the United States vis-à-vis 66 trading partners showing that international political factors, such as arms transfers from NATO countries and the number of foreign agents registered in the United States were ‘significant enhancement factors’ in export and import equations for the United States in the years 1978 and 1982.

Recently there has been a surge in the empirical trade literature that makes a clearer and more unambiguous link between trade and trade-related political (or ‘diplomatic’) activities. The focus is on specific manner of diplomatic exchange such as the influence exerted by the full infrastructure of embassies and consulates (Rose 2007), changes in this infrastructure (Maurel and Afman 2010, especially regarding Eastern Europe) and official state visits supported by this infrastructure (Nitsch 2007). Embassies and consulates may be of interest

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for two distinct reasons. Firstly, good and stable political relations by building on mutual trust provide the first best instrument to reduce the risk of future distortions and trade disruptions (Van Marrewijk and Van Bergeijk 1993). Secondly, embassies and consulates help to generate knowledge about (future) opportunities for trade and investment and thus may add to the stock of knowledge about foreign markets which – if shared with (potential) exporters – reduces the costs that have to be incurred for exporting to and investing in these markets (on the former aspect see Krauthheim 2007). The seminal paper in the recent strand of the literature is Rose (2007) who using a gravity model for the year 2002 for 22 exporting countries and 200 importing countries provides the first empirical multi-country investigation into the question whether exports are in fact systematically associated with the number of diplomatic representations abroad. His finding of a significant and economically meaningful impact has stimulated a lot of research and these follow-up studies consistently find significant and empirically relevant indications for trade creation by means of economic diplomacy. Afman and Maurel (2010), for example, estimate that the opening of an embassy in an emerging market in Eastern Europe is equivalent to an *ad valorem* tariff reduction of 2 to 12 percentage points.

Most studies have followed the framework of Rose (2007) in particular using the same or a comparable trade data set. Although the number of destinations that are covered in these studies is large (some 150 to 220 countries) and coverage thus appears to be sufficient to enable useful generalization with respect to destinations, the datasets are rather skewed. On the one hand, the 150 to 200 import destinations may imply large cross-country heterogeneity leading to invalid results and on this account the number of importing countries needs reconsideration. On the other hand, the sample of countries from which international trade flows originate is rather restricted as the available studies have so far focused on the exports of a select group of countries, namely the larger OECD countries and the BRIIC countries (Rose 2007, Segura-Cayela and Vilarrubia 2008, Afman and Maurel 2010). Often the focus is even narrower. Gil-Pareja et al. (2007) investigate exports of tourism services that originate in the G7 countries. The available econometric studies that deal with state visits only cover the US, Germany, France and Canada (Head and Ries 2006, Nitsch 2007). Thus these studies offer little guidance on the question whether economic and commercial diplomacy can or cannot be of use for developing countries. Would the same results still be obtained for a wider range of exporting countries? To answer this question many more countries would have to be included on the exporter side, especially lower-income countries.

The contribution of this article is that it provides this more balanced and much broader perspective and thus enables us to focus deeper on the effects of economic diplomacy upon trade between different country groups according to different income levels. Moreover, this approach provides us with a fresh perspective on the potential utility of economic and commercial diplomacy in the context of South–South trade, an issue which has not been investigated so far.

We arrive at this more balanced dataset by increasing (reducing) the number of exporting (importing) countries to 63, so that a 63 x 63 trade matrix results. The analytical range of the study is extended to include much more low and middle income countries. In the discussion of our empirical results we will often refer to Rose's findings as this has become the major reference on this topic, but it should be noted that the other studies that we discussed are equally vulnerable for a critique on the way their data sets have been constructed. Table 1 compares the countries studied by Rose and the countries used in the present analysis and Appendix I provides a list of the countries concerned. It is important to note that the symmetry of our 63 x 63 country matrix (which contrasts to the Rose 22 x 200, the Segura-Cayela and Vilarrubia 21 x 163, the Gil-Pareja 7 x 156 and the Nitsch 3 x 200 matrices) will allow us to assess the import facilitating role of embassies and consulates on the same footing as their export promoting function.

TABLE 1
Comparison of the sample of Rose (2007) and the sample in this study

	<i>Rose (2007)</i>		<i>This study</i>	
Low-income countries (LIC)	1	5%	8	13%
Lower-middle income countries (LMIC)	2	9%	14	22%
Upper-middle income countries (UMIC)	5	23%	14	22%
High-income countries (HIC)	14	64%	27	43%
Total	22	100%	63	100%

The remainder of this working paper is organized as follows. Section 1 provides a discussion on the economic rationale for embassies and consulates as a means to provide market access and to reduce market failures. Arguably the market failures that can be repaired by means of government intervention through economic and diplomatic diplomacy are especially relevant for developing countries. Section 2 sets the stage for the empirical analysis. We explain our empirical tool (that is the gravity model of international trade), argue why this approach is especially apt for the present analysis and discuss the construction of our data set. Section 3 presents the general empirical results of a cross section analysis of the impact of embassies and consulates on 3730 bilateral trade flows in the year 2006. We also consider three econometric issues that appear important for the interpretation of our results: the issue of possible reverse causality between trade and the extent of foreign diplomatic representation, the country-pair-wise fixed effects and the impact of 176 zero trade flows (i.e. 4.5% of the potential observations). Section 4 then zooms in on the question of how the level of economic development interacts with the impact of embassies and consulates on trade. We find that the effect within the group of higher income countries is not significant. Probably information about these markets and their institutions is sufficiently well established so that public intervention is not necessary. For the relations between and with developing countries the network of embassies and consulates, however,

provides a significant and very useful trade enhancing role. The final section concludes and discusses the policy relevance of our findings in particular in relation to South–South trade.

2 WHY DOES ECONOMIC AND COMMERCIAL DIPLOMACY MATTER?

It is probably fair to say that most ‘Economics 101’ courses introduce the welfare gains of international trade by a discussion of comparative advantage based on David Ricardo’s example of the trade between Britain (wool) and Portugal (wine) and thereby follow the suggestion implicit in his *Principles of Economics* that this pattern of specialization is a direct consequences of the free functioning of markets. Ricardo ([1817] 1962, para. 7.1) assesses his theory of comparative advantage (that explains the ‘natural trade’ that leads Portugal to export wine and England to export cloth) as follows:

Under a system of perfectly free commerce, each country naturally devotes its capital and labour to such employments as are most beneficial to each. This pursuit of individual advantage is admirably connected with the universal good of the whole. By stimulating industry, by regarding ingenuity, and by using most efficaciously the peculiar powers bestowed by nature, it distributes labour most effectively and most economically: while, by increasing the general mass of productions, it diffuses general benefit, and binds together by one common tie of interest and intercourse, the universal society of nations throughout the civilized world.

The issue, however, that is relevant for our discussion is that trade in wine and cloth between Portugal and England had not been the outcome of free trade at all. On the contrary, the trade in wine and cloth between Portugal and England was the result of commercial and economic diplomacy and had been arranged in the context of the Methuen Treaty, a military and commercial treaty between Portugal and England signed in 1703 as part of the War of the Spanish Succession (Felipeco and Vernengo 2002). This historical context of one of the most important tools of trade analysis provides the lesson that comparative advantage is only one side of the coin and that economic and commercial diplomacy can be important drivers of trading patterns as well. The remainder of this subsection addresses the question why this is so.

In a nutshell, economic diplomacy is the use of international political tools (diplomacy) to obtain economic objectives and as such has actually existed ever since ancient civilisations have engaged themselves in commerce and trade (Coolsaet, 2001). Public officials from overseas missions such as embassies and consulates, Foreign Affairs and other government departments (such as Economic Affairs, Trade and Commerce) are involved in the promotion of foreign direct investment and international trade by supplying information and advise about trade and investment opportunities and by organising and helping to act as hosts to trade missions from the home country (Saner and Yu 2003 provide a detailed discussion). The neo classical argument, however, is that firms can be expected to enter foreign markets on their own account and if they have to be aided by governments – then, perhaps their products are just not good enough. If so the tax payer’s money that ultimately finances

commercial policy and economic diplomacy is wasted, just as in the case of a traditional export subsidy. Commercial policy and economic diplomacy imply a transfer (for example a free service) from the public sector to commercial activities while it is *a priori* unclear if the private benefits exceed the cost of providing the public service. Still economic diplomacy and commercial policy remain relevant real world phenomena. Is this because the economic recipe is wrong, or is this just another case of economists that are right but are unable to get it right?

At a very practical and concrete level, the public sector's involvement may be necessary for three reasons. First, the type of product may require public sector involvement either on the demand side (for example large infrastructural works) or on the supply side (military or dual use goods). Second, trading may require public sector involvement at the side either of the exporter or of the importer, for cultural reasons or because the public sector is dominant and/or (former) state enterprises are involved (typically this is relevant for the relatively new entrants to the world economic system, *i.e.* many developing countries). Third, high ranking government officials such as ambassadors may be needed to signal the importance that a country attaches to the commercial relationships that will be discussed thus offering an implicit guarantee that these relationships will be free from negative political disturbances. All three arguments boil down to the fact that public sector involvement is a necessary condition for market access and thus an instrument to reduce or eliminate cultural non-tariff barriers to trade and investment.

A key insight of the recent literature is that, moreover, diplomatic representations may provide a superior level and quantity of trade-and-investment-related knowledge. This insight implies that market failure regarding the production of (private) knowledge may provide a further economic theoretic argument for economic diplomacy. An exporting firm needs a lot of information about foreign markets before it can successfully attempt to trade with a firm in another country. Sometimes this information is acquired experimentally by trying to enter the country, but often consultants and business trips as well as information from export promotion agencies or colleagues will be tapped. The relevant topics about which firms typically need information include: local consumer preferences and their ability to adapt to new products *e.g.* the need to adapt products and their marketing to local needs (including language, technical and meteorological, religious and cultural aspects); the reliability of local trading partners, that is the opportunities to establish long-term relationships which may include customs as well as laws and legal procedures; the distribution networks that exist or can be developed (which typically also involve the availability of modern communication networks, harbour facilities and so on); quality standards and legal, environmental and institutional requirements; prospects for markets, in particular the niches and products where profit opportunities exist; and the local negotiating and contracting procedures as well as the extent to which contracts are actually enforced. As a general rule, the necessary information requires substantial investment (even when acquired on a trial and error basis) and will be imperfect in nature. Often such manner of information has an asymmetric character; because the firms in the importing country have a substantial advantage in both acquiring and developing such country-specific

knowledge and in assessing the reliability of such information. Typically, this manner of knowledge is built in networks of foreign firms (because proximity and existing business and personal networks are often a pre-condition), but such networks may also act as a barrier to entrée. Moreover, investing in better knowledge does not take place in the private sector because of externalities (such as demonstration effects that can be followed suit by competitors), free rider problems or due to the public good character of certain manner of information, which according to Harris and Li (2005, p. 74) include:

unique, reliable and impartial access to information, such as through the global embassy network and other government channels and contacts, which become available through the government's very long-term, and non-commercial attachment to overseas markets.

The relevant rationale for government intervention, that is an active role in the generation of knowledge or the allocation of subsidies to investments in such knowledge, rests on the fact that the production of knowledge about foreign markets will be sub-optimal and that access to such knowledge in some cases actually requires involvement of government officials. Indeed, if such learning externalities do exist then the market does not supply the optimal investment of firms in international activities basically because expropriability problems exist.

Governments, moreover, may have other roles to play when market failures occur (see Alexander and Warwick, 2007), for example, in signalling the quality of its exporters. Generally speaking the authorities can clarify that their firms have to meet high standards in terms of product quality, environmental standards, corporate responsibility and, moreover, they may be able to communicate that their economy is a reliable partner in international trade. Such promotional information may be seen as an investment in the exporting nation's trademark or 'trade capital' and as such has a public good character.

The mere existence of a market failure and the possibility that public intervention may fix that problem, however, constitutes a necessary but never a sufficient condition, as noted by Hoekman and Smarzynska-Javoricik (2004, p. 3):

Pro-active support policies of whatever stripe should be subject to cost-benefit analysis and be informed by answers to the following types of questions: where is the market failure? What is the objective of a policy? How is the performance and cost effectiveness going to be monitored? It should also be recognized that such interventions are frequently associated with the risk of misdiagnosing the problem and the possibility of capture by rent seekers.

The government intervention should thus generate more benefits to society than it costs (including the distortions introduced by taxation). Obviously such a cost-benefit analysis would go beyond the scope of this paper given the large number of countries involved. But we do provide important basic information for cost-benefit analyses by testing empirically whether embassies and consulates promote trade. It is important to estimate the impact of economic diplomacy empirically, because rejection of the hypothesized positive impact of

embassies and consulates would imply a negative outcome for a cost-benefit analysis. We now turn to this important empirical question.

3 EMPIRICAL DESIGN: THE GRAVITY APPROACH

A lot of models have been used to describe international trade flows. Models do not only differ with respect to the degree of detail, but also with respect to the specific theoretical interest of the investigator. For the present study we use a relatively simple empirical model. Tinbergen (1962, pp. 262–93) developed the gravity model and Linnemann (1966) is the traditional reference on the early gravity model. The gravity model has become the empirical workhorse for many investigations in economic trade and has a rich history in the regional economics literature. In the basic model three explanatory variables appear: (i) the exporting country's Gross Domestic Product Y_i , (ii) the importing country's GDP Y_j and (iii) the distance D_{ij} between the two countries. The basic model is known in international trade theory as the gravity equation, because of its similarity to the Newtonian law of gravity: the bilateral trade flow is assumed to be a function of the economic masses of the two trade partners and the inverted distance between the two countries. The intuition behind this formula is appealing. First, the supply of goods depends positively on the exporting country's economic size and production capacity which is represented by its GDP. Second, the demand for these exports depends positively on the importing country's market which is also represented by its GDP. Third, transportation costs, transportation time and the 'economic horizon' of the exporter (all assumed to correspond roughly with the geographic distance between the exporting and importing country) have a negative impact on trade. Formulated in this intuitive way the gravity equation appears to be the reduced form solution to a not explicitly formulated supply and demand system. Hence we have the following equation for the gravity model in its simplest form.

$$E_{ij} = Y_i^\alpha Y_j^\beta D_{ij}^\gamma \quad (1)$$

Here $\alpha > 0$, $\beta > 0$ and $\gamma < 0$, while E_{ij} are the exports from country i to country j . Usually the populations N_i and N_j of the trade partners are added to this equation as are a number of other (often binary or dummy) variables that represent trade enhancing and trade resistance factors that are typically relevant in bilateral exchanges. Examples of such factors comprise, among others, a common border, a common language, a common currency, or an (ex) colonial relationship, but also individual country characteristics are added such as the area of the economy or the fact that it is an island economy.

The gravity model which has been widely used in policy institutions since the 1960s can be derived on the basis of economic theory. Bergstrand was the first to relate the gravity equation to its microeconomic foundations (Bergstrand 1985) and to give a formal derivation of the gravity equation within the context of a general equilibrium model of world trade with imperfect competition and product differentiation (Bergstrand 1989). Deardorff (1995), Feenstra et al. (2001) and Evenett and Keller (2002) are

examples of contributions to the gravity literature that showed that the model can be derived from Heckscher-Ohlin, increasing returns to scale, Ricardian models, and so on. Interest in the gravity equation and its ability to track non-economic factors was also stimulated by the influential article by Anderson and van Wincoop (2003). Policy barriers, information and enforcement costs and diverging rules and legal frameworks were shown to exercise the same impact as an ad valorem tariff equivalent of 44% (that is twice the impact of transportation costs). Indeed, it is this cost component that definitely produces negative externalities and therefore it should be the target for policy makers that want to minimize the cost of distance. Empirical research, moreover, uncovered distance's truly multidimensional (economic, cultural, political and so on) nature (see Linders et al. 2004 for a review of the literature) and also these new dimensions proved to be very stimulating.

In assessing the potential utility of the gravity approach for the present empirical investigation one has to consider both the strengths and the weaknesses of the method. On the one hand, the critics of the model are right in many respects. For example, the analysis is essentially of a comparative static nature. Only one equation is used to explain the value of total exports to another country. So basically we have a turnover relation in which prices are not specified. Moreover, substitution between trade flows is absent (that is the issue of trade diversion is not really covered; see Bikker, 2010). On the other hand the model's simplicity constitutes its strength, because the model deploys only a limited number of variables and this facilitates computation, keeps the data problems manageable and the results better traceable. Noteworthy is the gravity equation's ability to incorporate 'empirical regularities' such as intra-industry trade, the impact of transport costs and the influence of differences in *per capita* income on trade flows. More important, however, is the observation that the problem that is to be addressed in this paper concerns the question of increased explanation when we include certain instruments of economic and commercial diplomacy in a traditional trade model. As this investigation deals with the actual impact of economic and commercial diplomacy on the level and pattern of bilateral trade flows, the choice of the gravity model is almost unavoidable because the gravity model provides an empirical explanation for the geography and level of bilateral trade flows. In addition, robustness and general acceptance of the method are essential for our analysis. Therefore it is relevant that the gravity model presently is accepted both in academic and in policy circles.

In our research we will follow Rose's research design as closely as possible so as to provide a useful basis for comparison. In particular we will use his reduced form gravity equation and where possible we use the same sources for the explanatory variables. The equation to be estimated is

$$\begin{aligned} \ln(X_{ij}) = & \beta_0 + \beta_1 \ln D_{ij} + \beta_2 \ln(Y_i) + \beta_3 \ln(Y_j) + \beta_4 \ln(Pop_i) + \beta_5 \ln(Pop_j) \\ & + \beta_6 \ln Lang_{ij} + \beta_7 \ln Cont_{ij} + \beta_7 \ln Land_{ij} + \beta_8 \ln Island_{ij} + \beta_9 \ln(Area_i * Area_j) + \\ & \beta_{10} \ln Col_{ij} + \beta_{11} \ln CU_{ij} + \beta_{12} \ln FTA_{ij} + \gamma EmbCon_{ij} + \varepsilon_{ij} \end{aligned} \quad (2)$$

where i denotes the exporter, j denotes the importer, and the relevant variables are as follows:

- X_{ij} is merchandise exports in dollars for the year 2006, from i to j ;
- $EmbCon_{ij}$ is the number of embassies and consulates (i.e. official foreign missions) that i has in j ;
- D_{ij} is the distance between i and j ;
- Y_k is GDP *per capita* in dollars in 2006, for $k = \{i, j\}$;
- Pop_k is average population (in millions of people in 2006), for $k = \{i, j\}$;
- $Area_k$ is the area of the country (in square kilometres) for $k = \{i, j\}$;

and the following dummy variables:

- $Lang_{ij}$ is 1 if i and j have a common language, 0 otherwise;
- $Cont_{ij}$ is 1 if i and j share a land border, 0 otherwise;
- Col_{ij} is 1 if i and j are colonies or shared a colonial relationship, 0 otherwise;
- CU_{ij} is 1 if i and j use the same currency, 0 otherwise;
- FTA_{ij} is 1 if i and j belong to the same regional trade agreement, 0 otherwise;
- $Landl_{ij}$ is the number of landlocked countries in the country-pair: 0 if both i and j are not landlocked, 1 if either i or j is landlocked, and 2 if both i and j are landlocked;

and ε_{ij} is the error term.

Since we estimate this equation for a more recent year 2006 (the study by Rose refers to 2002), the process of updating generates small differences which we discuss below. Note that we will to some extent take care of this issue (that may distort comparison with other studies in the field) by replicating Rose's research for a matrix of his 22 exporters x our 63 import destinations.

Data on bilateral trade flows in millions of US dollars at free-on-board prices were collected from the International Monetary Fund *Direction of Trade Statistics* for the year 2006. GDP *per capita* data and population figures (millions of people) were obtained from the IMF *World Economic Outlook* Database, April 2007. Data on distance, area, common language, common border, colonial relationship, and landlockedness, were collected online from CEPII (Centre d'Etudes Prospectives et d'Informations Internationales) which provides area of countries in km² and the geodesic distances between countries using the great circle formula. The colonial binary dummy variable chosen for the current analysis specifies whether two countries ever had a colonial link throughout history. We constructed the two binary dummy variables for whether countries are in the same currency union (CU), and are in the same regional trade agreement (RTA) manually by inspecting the WTO website on all RTA's and CU's ratified until 2006. The data set for the number of embassies and consulates has been constructed on the basis of the websites of the 63 ministries of Foreign Affairs concerned. Here our data differ from Rose's data with respect to the year of observation, and because we do count embassies and consulates irrespective of their location in a country and because we do not count so-called permanent representations because the diplomats of

such embassies work in international organizations (such as UN, ILO or NATO) and are not involved in bilateral trade and investment. Anyhow these differences are small.

4 EMPIRICAL RESULTS

Table 2 summarizes the results of the regression analyses. Table 2 starts with Rose's (2007) results in column 1 for a sample of 22 exporting countries and 200 importing countries in the year 2002. Next we provide for the year 2006 as close a replication as possible starting with a sample that consists of the same 22 exporting countries and our sub-sample of 63 importing countries (column 2). Column 3 reports the findings for our full sample of 63 exporting and 63 importing countries. Before we move to the variable of interest, 'the number of foreign missions', we take a closer look at the general performance and the other variables of the gravity model. Comparing columns 1 and 2 we note that the results obtained are close to those of Rose with equal signs of the estimated coefficients, and a comparable explanatory power. Roughly half of the coefficients estimated is about the same although we obtain estimates that are smaller in absolute terms for the coefficients RTA, CU, common language, land border, landlocked, and especially the island and the (ex)colonial dummy variables that become insignificant in our estimates. All in all we are able to replicate Rose's findings to a large extent. This is an important indication that differences between our full sample findings and those of Rose are probably not due to the fact that we study a different year or have a smaller sample of importing countries. Rather these differences would seem to occur because we study a larger (and symmetric) group of exporting countries.

We can now take a look at how the enlargement of the data set influences the estimates as shown for the full sample 63 x 63 (column 3). Typically the absolute values of the coefficients for the core model (distance, *per capita* GDP and population) are comparable or larger whereas the coefficients for the dummy variables have a mixed record. Some coefficients converge to the estimates of Rose (2007) such as the common land border dummy and the currency union dummy which is now both significant and negative. Incidentally, we think that the latter result does not so much reflect the impact from currency unions as well as the fact that the major currency union (EMU) relates to OECD countries only and may thus be picking up the differences between developing and developed countries that we will discuss in section 5. Other coefficients increase such as product area and a common language illustrating how information on a broader data set reflects in the estimated coefficients. In view of the changes the estimated coefficient economic and commercial diplomacy appears to be rather stable.

The coefficient of interest is the number of embassies and consulates. The coefficient estimates are positive and significant ranging from 0.06 to 0.09. Therefore based on a different sample of countries and sample year, we can agree with Rose (2007) when he argues that embassies and consulates are systematically linked with increasing exports. This is a relevant finding because Rose's conclusion was limited to a much smaller sample of mainly high income exporting countries. We will show in section 5 that Rose's conclusion needs

TABLE 2
Empirical results of the OLS estimation of the gravity equation)

Model	(1)	(2)	(3)	(4)	(5)
Sample	Rose 22 x 200	Replication 22 x 63		Full sample 63 x 63	63 x 63
Year of observation	2002	2006	2006	2006	2006
N	4123	1356	3730	3730	3730
Number of foreign missions† (export promoting)	0.10*** (0.02)	0.06*** (0.01)	0.09*** (0.02)		0.09*** (0.02)
Number of foreign missions, j in i (import facilitating)				0.05** (0.02)	0.03 (0.02)
Log distance	-0.69*** (0.04)	-0.79*** (0.04)	-0.74*** (0.04)	-0.75*** (0.04)	-0.74*** (0.04)
Log exporter GDP p/c	0.86*** (0.03)	0.86*** (0.04)	1.23*** (0.02)	1.22*** (0.02)	1.21*** (0.02)
Log importer GDP p/c	0.83*** (0.02)	0.89*** (0.02)	0.99*** (0.02)	1.01*** (0.02)	1.99*** (0.02)
Log exporter population	0.96*** (0.03)	0.98*** (0.03)	1.28*** (0.03)	1.28*** (0.03)	1.27*** (0.03)
Log importer population	1.01*** (0.02)	1.00*** (0.02)	1.18*** (0.03)	1.21*** (0.03)	1.17*** (0.03)
Regional Trade Agreement † (dummy)	0.86*** (0.08)	0.29*** (0.07)	0.37*** (0.06)	0.38*** (0.06)	0.37*** (0.06)
Currency union † (dummy)	-0.27 (0.18)	-0.10 (0.15)	-0.34* (0.18)	-0.33* (0.18)	-0.35** (0.18)
Log product area	-0.15*** (0.01)	-0.14*** (0.02)	-0.20*** (0.02)	-0.19*** (0.02)	-0.20*** (0.02)
Common language (dummy)	0.57*** (0.07)	0.34*** (0.10)	0.71*** (0.10)	0.72*** (0.10)	0.69*** (0.10)
Land Border (dummy)	1.06*** (0.16)	0.37** (0.16)	0.90*** (0.17)	0.95*** (0.17)	0.86*** (0.17)
Landlocked (dummy)	-0.75*** (0.05)	-0.31*** (0.09)	-0.23*** (0.08)	-0.23*** (0.08)	-0.22*** (0.08)
Islands (dummy)	-0.27*** (0.05)	-0.05 (0.06)	-0.07 (0.06)	-0.08 (0.06)	-0.07 (0.06)
Colony (dummy)	3.25*** (0.38)	0.14 (0.15)	0.04 (0.18)	0.07 (0.18)	0.02 (0.18)
R ²	0.77	0.77	0.67	0.67	0.67

***, **, * implies significance at 99, 95 and 90% levels respectively.

† Empirical implementation of the variable is slightly different from Rose (2007)

Standard errors reported in parentheses.

Included in the regression but not reported is the constant.

further qualification since the effect seems to be driven to a large extent by the trade flows that originate or end in low and middle income countries.

The symmetric nature of our data matrices allows us to investigate import facilitation in addition to and in combination with the export facilitation that we have studied until now. The measurement of import facilitation is simply the inverse of export facilitation. Many of the functions of embassies and consulates such as providing information, building trust or public involvement matter as much for imports as for exports. Indeed attracting business and imports towards the domestic economy is an essential function of economic diplomacy. Thus the exports of goods from, for example, Egypt to the Netherlands may be stimulated by both the export facilitating role of the Egyptian embassy in the Hague and the import facilitating role of the Netherlands embassy in Cairo. This is, however, an empirical question: if import facilitation turns out to be insignificant, then outward economic diplomacy is more effective in fighting market failures than inward economic diplomacy.

Two additional regressions provide information. Column 4 in Table 2 replaces the independent variable ‘number of foreign missions’ with the import facilitating representation ‘number of foreign missions, j in i ’ and reports a significant effect of import facilitation. An extra mission of the exporting country in the importing country leads to 5% more imports for the importing country if we do not take into account of the export facilitating effect. Column 5 in Table 2, however, takes simultaneously the presence of the exporting countries in the importing countries (i in j) and also the presence of the importing countries in the exporting countries (j in i) into account. In this specification the import facilitating embassies and consulates are insignificant. Export facilitating representations are still significant increasing exports once more by 9%. This suggests that diplomatic representations do not focus on attracting business towards the domestic home markets as much as they support businesses abroad.

Thus, import facilitation is not as significant a task in influencing trade. We will check this finding in a subsection when we introduce fixed effects. Indeed, before we can continue with a more detailed discussion of how the level of economic development interacts with the impact of embassies and consulates on trade, we will first have to address three econometric issues (endogeneity, fixed effects and zero trade flows) in order to check whether the present research design can cope with these issues that are general nuisances of applied gravity models.

4.1 Endogeneity: reverse causality

So far we have assumed that an effect exists which foreign missions exert on trade, but it is not unreasonable to assume that it is also possible that diplomatic missions will be set up in countries with which one has already strong economic and/or political relationships. If this is the case then endogeneity of the number of foreign missions is of econometric concern because the problem of reverse causality leads to biased and inconsistent estimates. We address this issue by introducing instrumental variables that

TABLE 3
Instrumental variables

	(1) TSLS 63 x 63	(2) GMM 63 x 63	(3) Durbin-Wu-Hausman (OLS) 63 x 63
Number of foreign missions, i in j	0.16** (0.06)	0.16** (0.06)	0.13*** (0.05)
Log distance	-0.73*** (0.04)	-0.72*** (0.04)	-0.75*** (0.04)
Log exporter GDP p/c	1.21*** (0.03)	1.21*** (0.03)	1.23*** (0.02)
Log importer GDP p/c	0.97*** (0.03)	0.98*** (0.04)	0.98*** (0.03)
Log exporter population	1.27*** (0.03)	1.26*** (0.03)	1.28*** (0.03)
Log importer population	1.14*** (0.04)	1.14*** (0.04)	1.16*** (0.03)
Dummy Regional Trade Agreement	0.37*** (0.06)	0.35*** (0.07)	0.39*** (0.06)
Dummy Currency union	-0.35** (0.18)	-0.33*** (0.11)	-0.34* (0.18)
Log product area	-0.20*** (0.02)	-0.20*** (0.02)	-0.20*** (0.02)
Dummy Common language	0.68*** (0.10)	0.68*** (0.09)	0.70*** (0.10)
Dummy Land Border	0.81*** (0.19)	0.82*** (0.16)	0.91*** (0.17)
Dummy Landlocked	-0.22*** (0.08)	-0.21*** (0.07)	-0.23*** (0.08)
Dummy Islands	-0.06 (0.06)	-0.08 (0.06)	-0.07 (0.06)
Colony	0.01 (0.18)	0.001 (0.14)	0.05 (0.18)
ResidIV			-0.04 (0.05)
N	3730	3730	3730
R ²	0.67	0.67	0.67

***, **, * implies significance at 99, 95 and 90% levels respectively.

Standard errors reported in parentheses. Included but not reported is the constant.

correlate with the number of foreign missions each exporter has in each importing country and yet are uncorrelated with the error term of bilateral trade between these two countries. Following Rose (2007) we collect two groups of instrumental variables that either measure the geo-political weight a country, such as the amount of proven gas reserves (in cubic metres) or the amount of proven oil reserves (in billions of barrels), or measure the quality of living and attractiveness as the desirability of residing in a particular country may be an incentive for diplomats to set up missions (such as the number of Economist city guides, the number of Lonely planet guides and the climate, that is whether the country experiences monsoonal rains). An auxiliary regression of the number of embassies and consulates on these instrumental

variables has an R^2 of 0.24 indicating that the instrumental variables chosen are not exactly of great quality but could suffice especially since the first-stage F statistic is significant at the 99% which gives hardly any concern about weak instruments.

The results of the Instrumental Variable (IV) estimation are summarized in Table 3. The first column uses Two-Stage Least Squares (TSLS) whereas the second used Generalised Methods of Moments (GMM). Like Rose (2007) we find that IV using either TSLS or GMM do not invalidate the results obtained in the previous sections. Moreover, the measured effect of foreign missions upon exports is even higher with IV estimation than with OLS (although slightly less significant): 0.16 whereas 0.09 was obtained earlier (see Table 2, column 3). Note that the measurement of this coefficient is less precise in Table 3 as the standard error of the coefficient estimate is three times larger than the 0.02 reported in Table 2 so that the level of significance drops from 99% to 95% (which is still sufficient of course). Column 3 of Table 3 in addition reports the Durbin-Wu-Hausman test for endogeneity, where we regress the number of foreign missions on the five instrumental variables and then include the residuals of this auxiliary regression (ResidIV) as a new variable in the initial gravity equation. The confidence level of ResidIV is 56% only so that the coefficient is not significantly different from zero. Therefore, also on the basis of the Durbin-Wu-Hausman test we can safely conclude that the number of foreign missions is exogenous and that our estimates do not appear to suffer from reverse causality.

4.2 Fixed effects

Standard cross-section estimates of the gravity model may provide biased estimates because of omitted variable bias. For one reason, as Cheng and Wall (2005) point out, “cultural, historical and political factors are often difficult to observe, let alone quantify” Therefore they argue that estimates of the gravity model, no matter which new variables are introduced, will always be biased and that any regression analysis will suffer from heterogeneity bias. Cheng and Wall (2005) provide a straight forward solution. They add simple fixed-effects (FE) to the model which represent “fixed pair-specific factors that may be correlated with levels of bilateral trade and with the right-hand-side variables” (Cheng and Wall 2005). In the case of a cross-section as in the present paper, fixed-effects can be introduced by sets of binary dummy variables: one for the exporter and one for the importer.

Table 4 presents results of Fixed Effects (FE) for all combinations of export facilitation, import facilitation and exporter FE and importer FE. For the sake of comparison OLS coefficients are reported in the column 1. Three forms of FE are used: one using only exporter FE (column 2), one using only importer FE (column 3) and in the penultimate column using FE for both the exporter and the importer simultaneously. For the equations that investigate the export promoting aspect of embassies and consulates the coefficient estimates are in the range of 0.06 to 0.10 and are consistently significant at a 99% confidence level. The reported estimates for import facilitating representations range between an insignificant 0.03 (in the cases of simple OLS and Exporter FE) to 0.06 in the other cases (significant at a 95% confidence level and better). These

findings imply that controlling for unobserved factors is important if we want to explain export facilitation and/or import facilitation. Note that the coefficient reported in column 5, Table 2 suggested import facilitation to be of insignificant impact once we controlled for the export promoting role of on embassies and consulates. The findings in Table 4 provide a somewhat different view. Although the effect of export promoting representations in general continues to be stronger than the effect of import facilitating, we find that import facilitation matters once we take account of importer fixed effects.

TABLE 4
Coefficient estimates number of foreign missions with fixed effects (FE)

Model	OLS	Exporter FE	Importer FE	Exporter and importer FE
	(1)	(2)	(3)	(4)
1 Export Promoting	0.09***	0.10***	0.06***	0.06***
2 Import Facilitating	0.05**	0.06***	0.06***	0.05**
3 Export promoting and Import facilitating	0.09*** 0.03	0.09*** 0.03	0.05** 0.04**	0.05** 0.05**

***, **, * implies significance at 99, 95 and 90% levels respectively.

Included but not recorded are the explanatory variables of the gravity model as reported in Table 2.

4.3 Zero trade flows

Out of a potential of 3906 bilateral trade flows we have 176 cases (4.5%) in which no trade flow is recorded. For practical estimation purposes zero-flow observations were left out. The most obvious practical problem is that $\ln(0)$ is not defined. Note, moreover, that a zero trade flow according to equation (1) would seem to require that at least one of the explanatory variables is zero. The gravity model predicts zero flows only when at least one explanatory variable is zero and for the explanatory variables in the present model this is unlikely to be the case. Hence for (approximately) zero trade flows, the model may not give an appropriate description of the relationship between trade flows and its explanatory variables. Trade data sources, however, generally do only report annual bilateral trade flows that exceed some threshold. Consequently, relatively small transactions may occur when the data source reports a (rounded off) zero. The combination of actual trade and officially reported zero flows may also occur in the case of smuggling or politically sensitive goods such as military procurements. So the trade registration system obviously generates zero or near-zero flows that do not require one of the explanatory variables to be zero. Typically in other investigations zero trade flows are a much more substantial nuisance (Rose has 277 cases or 6.3%, but even in his study the problem of zero trade flows is not really as important as in most applications of the gravity model, see van Bergeijk and Brakman, 2010). The relevant question is: does the existence of zero flows matter for our results. First we take a look at the characteristics of these trade flows.

TABLE 5
Zero trade flows

	(1)	(2)	(3)	(4)
Substituted value		0.5	500	5000
N	3730	3906	3906	3906
Number of foreign missions† (export promoting)	0.09*** (0.02)	0.14*** (0.04)	0.13*** (0.03)	0.12*** (0.02)
Log distance	-0.74*** (0.04)	-0.88*** (0.04)	-0.79*** (0.05)	-0.75*** (0.04)
Log exporter GDP p/c	1.23*** (0.02)	1.66*** (0.04)	1.42*** (0.03)	1.31*** (0.03)
Log importer GDP p/c	0.99*** (0.02)	1.36*** (0.05)	1.15*** (0.03)	1.07*** (0.03)
Log exporter population	1.28*** (0.03)	1.53*** (0.05)	1.38*** (0.04)	1.32*** (0.03)
Log importer population	1.18*** (0.03)	1.43*** (0.06)	1.28*** (0.04)	1.21*** (0.03)
Regional Trade Agreement (dummy)	0.37*** (0.06)	0.19* (0.12)	0.25*** (0.08)	0.27*** (0.07)
Currency union (dummy)	-0.34* (0.18)	-0.79** (0.34)	-0.48** (0.23)	-0.36*** (0.19)
Log product area	-0.20*** (0.02)	-0.20*** (0.03)	-0.20*** (0.02)	-0.19*** (0.02)
Common language (dummy)	0.71*** (0.10)	0.97*** (0.19)	0.82*** (0.12)	0.75*** (0.11)
Land Border (dummy)	0.90*** (0.17)	0.93*** (0.33)	0.93*** (0.22)	0.92*** (0.18)
Landlocked (dummy)	-0.23*** (0.08)	-0.19 (0.15)	-0.15 (0.10)	-0.12 (0.08)
Islands (dummy)	-0.07 (0.06)	0.04 (0.32)	-0.00 (0.08)	-0.01 (0.07)
Colony (dummy)	0.04 (0.18)	0.32 (0.35)	-0.13 (0.23)	-0.07 (0.20)
R ²	0.67	0.49	0.62	0.67

***, **, * implies significance at 99, 95 and 90% levels respectively.

† Empirical implementation of the variable is slightly different from Rose (2007)

Standard errors reported in parentheses.

Included in the regression but not reported is the constant.

In our sample zero exports occur rather frequently for Sudan (23), Vietnam (22), Algeria (16) and Uganda (16). Of the 176 zero trade flows some 87 (49.4%) are zero in both directions (that is bilateral exports and imports between country A and country B are zero). This group mainly consists of small countries that are located in different continents. Vietnam has the largest share in these bi-directional zero trade flows (16 flows or 18.3%). In the other 89

cases one flow (e.g. export) is zero, but the other flow (e.g. import) is strictly positive. There is no obvious pattern and one-sided zero flows occur in all continents and at levels of development although more often in the trade relations with lower and middle income countries that are located in different continents. In order to check whether this problem influences our results we perform a linear transformation of the dependent variable and add a small constant ν to all export data so that the zero observations become strictly positive and then re-estimated the equations. Table 5 summarizes the results. Column (1) repeats for convenience the preferred equation (Table 2, column 3). The other three columns show the results for different values of ν since the choice of the constant is rather arbitrary and can influence the results. Typically, however, the key result for the impact of embassies and consulates remains valid and appears to be even a bit stronger.

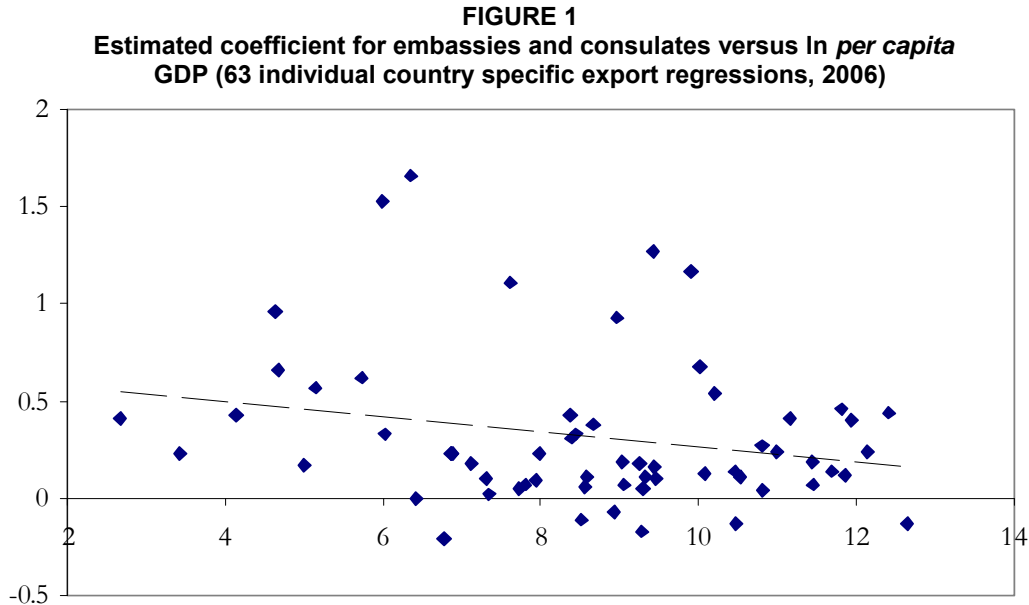
All in all our preferred equation survives a battery of econometric tests. We therefore conclude that it provides a useful tool to further investigate the relevance of our findings for countries at different levels of development.

5 ON THE INTERACTION BETWEEN DEVELOPMENT AND THE EFFECTIVENESS OF ECONOMIC AND COMMERCIAL DIPLOMACY

A number of factors suggest that the role of economic and commercial diplomacy is probably more important for the international economic relations of developing countries. First, asymmetries in the distribution of knowledge across countries are largest between the developed and the developing countries so that we would expect that public knowledge generation is especially relevant in the North–South and South–North relations. Second, trade-related institutions are less well developed outside the OECD and this is a reason to expect that the government has a larger role to play in trade relations that emerge or finish in the developing world. Third and related, transparent and easy accessible market information is available to a much larger extent for the developed countries so that we expect that economic and commercial diplomacy are less relevant determinants of their mutual trade. Indeed Piermonti and The (2005, p. 37) are right when they point out that search costs will tend to be higher between countries with different business practices, and where competitiveness and reliability are not well known to one another. Fourth, the role of embassies and consulates may be of particular relevance in the starting up phase of international trade and investment relationships (see, for example Afman and Maurel 2010) and on this account it may have a particularly high value added in trade between emerging markets. The assumption that embassies and consulates exert a stronger impact on trade for countries at lower levels of development is born out by the data.

Figure 1 is based on 63 regressions for individual countries (so we estimate an export equation for each of the countries in our dataset) and relates the estimated coefficient for the number of embassies and consulates to the observed *per capita* GDP of the exporting country. The figure illustrates a significantly negative correlation between on the one hand, the estimated coefficient for embassies and consulates and on the other hand, GDP *per capita*.

Figure 1 relates to total trade and although suggestive does not inform us in which bilateral trade relations embassies and consulates matter and to what extent. In order to answer that question we will have to create sub-samples that consist of bilateral trade flows between countries that are grouped according to their per capita GDP.

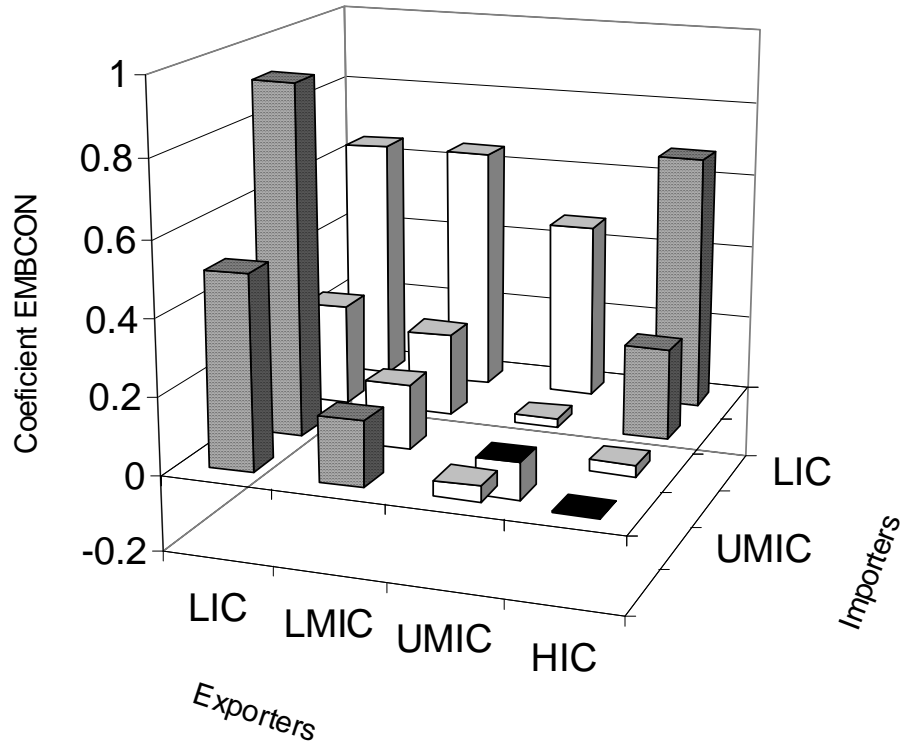


The regression excludes Uganda and Kuwait as their estimated coefficients are insignificant and because these countries are the largest positive and negative outliers. Coefficients are significant at the 95% confidence level and better.

Figure 2 provides a first impression of the more detailed results that pertain to the sub-sample analyses. Theoretically we could conceive of four different income levels (the well-known analytical country classification of the IMF and World Bank): low-income countries (LIC), lower-middle income countries (LMIC), upper-middle income countries (UMIC) and finally high-income countries (HIC). With four categories 16 sub-regressions (4×4) are run that analyse the trade between the different country groupings. It is not only important that we find a number of significant sub-segments, but also that we find insignificant, very small and even negative coefficients for the mutual trade of HIC and UMIC. The latter finding is the more relevant since the number of bilateral trade flows is relatively large for HIC and UMIC.

In contrast, many of the sub-samples each contain only a small number of bilateral trade flows (for N countries we have $N(N-1)$ bilateral trade flows). For example, the LIC sub-sample contains 8 countries. Thus the sub-sample regression that deals with LIC–LIC trade would only cover 56 potential

FIGURE 2
Estimates of the coefficient for embassies and consulates for 16 sub-
segments identified by *per capita* GDP



Note: Coefficients in grey are significant at the 99% confidence level (but for LMIC to HIC trade at the 90% level only)

bilateral trade flows. Likewise the set of potential bilateral trade relations between the LIC and LMIC countries contains 112 observations. Clearly, these numbers of observations are not enough to obtain robust efficient estimates when applying regression analysis with approximately 15 explanatory variables as in the present study. Estimating the 16 different coefficients according to the 16 different sub-samples provided standard errors that were indeed, relatively speaking, quite large. (Note though that the finding of a negative, but insignificant coefficient for HIC–HIC trade with 702 potential bilateral trade flows is highly informative as it refutes the hypothesis that embassies and consulates are important determinants for these trade flows.) Due to the small amount of observations in many cross sub-sample trade flows, it makes sense to combine on the one hand, the sub-samples LIC and LMIC ($8 + 14 = 22$ countries) so that we have one group of lower income countries and on the other hand, UMIC and HIC ($14 + 27 = 41$ countries) so as to have one group of higher income countries. Thus four separate regressions can be run based on larger sub-samples which provide more robust estimates. In particular we will estimate gravity equations that include both export facilitation and import facilitation (thus comparable to Table 2 column 5). The results of these four

regressions are found in Table 6 which shows that export facilitation is significant at the 99% level for trade between developing and developed countries (and in both directions) and also within the group of lower income countries (LIC and LMIC). In contrast within the group of higher income countries (UMIC and HIC) the coefficient for embassies and consulates is not significant. For import facilitation we find smaller coefficients that are often less significant, much in line with the findings reported in Table 2.

TABLE 6
Impact export and import facilitation for trade between different income country groupings (β-coefficients)

			<i>(To) Importing countries</i>	
			LIC + LMIC	UMIC + HIC
<i>(From)</i> <i>Exporting</i> <i>countries</i>	LIC + LMIC	Export facilitation	0.12***	0.11***
		Import facilitation	0.04	0.08*
	UMIC + HIC	Export facilitation	0.10***	0.02
		Import facilitation	0.10***	0.01

***, **, * implies significance at 99, 95 and 90% levels respectively.

Included in the regressions analyses but not recorded here are the constant and the explanatory variables of the gravity model as reported in table 2.

Our findings thus suggest that economic diplomacy (or more specifically, export facilitation by diplomats) does not matter within the group of higher income countries, but definitely could be important for lower income countries.

6 DISCUSSION AND POLICY CONCLUSIONS

Our replication of the seminal study by Rose (2007) with a larger sample of exporting countries and for a more recent year supports his finding that embassies and consulates facilitate trade. Positive significant estimates have consistently been obtained for the number of embassies and consulates in various specifications ranging from 0.06 to 0.16 for export facilitation. For trade by and with developing countries even larger elasticities were estimated. Moreover, we find that the trade facilitating effects go beyond exports as import facilitation has a significant and positive impact on bilateral trade when we incorporate fixed effects (although the impact of import facilitation is less than of export facilitation).

One finding of particular relevance is that economic and commercial diplomacy is probably more meaningful when it concerns establishing presence in developing countries rather than in developed countries. Within the separate group of developed countries, economic diplomacy or export facilitation is statistically not significant. Economic diplomacy amongst developing countries adds value as it facilitates higher trade volumes (and to a lesser but still significant extent between developing to developed and *vice versa*). The sensitivity analysis in Rose (2007, Table 2, p. 31) actually foreshadows some of

these results as he reports a smaller effect for a sub-sample of countries with *per capita* GDP above \$1000.

Our findings also conform to earlier empirical studies on related topics. Recently, Lederman et al. (2006) took up the issue of the effectiveness of export promotion in a group of 104 countries and the year 2005. The data set is based on a rich survey answered by 83 agencies, covering questions about their institutional structures, responsibilities, objectives and strategies, resources and expenditures, and activities and client orientation. Lederman et al. thus are able to give a good description of export promotion practices around the world. This study, however, is especially quoted for having found a correlation between *per capita* export promotion and *per capita* exports. The elasticity in Lederman et al. (2006) at the mean of the sample explains about 8% of the median country's export, which is more or less of the same order of magnitude as found in our study and in the empirical studies on the impact of embassies and consulates that we discussed in this article. However, and highly relevant from the perspective of the present article these results are driven by the developing countries suggesting substantial heterogeneity across levels of development. In particular it is important that for OECD countries the relationship in Lederman et al (2006) is insignificant like in our study; that is: the effect is zero.

Our results therefore also offer indirect support for the emerging empirical literature on new and intangible barriers the trade such as a lack of thrust, cultural differences and ineffective governance (a lack of an enforceable legal framework, accountability and stability). We have discussed a number of potential market failures which hamper international exchange and in our opinion our empirical results imply that embassies and consulates succeed in solving or reducing some of these market failures, the more so because of the fact that export facilitation between developed and developing countries is significant whereas it is not within the separate group of higher income countries. In our opinion this reflects that markets in the developing countries tend to be more incomplete implying that market failures may be more of a problem in these countries than in the industrial countries. Therefore it is relevant for our discussion that Dekker et al. (2006), Den Butter and Mosch (2003) and Guiso et al. (2004) find that a one standard deviation increase in thrust increases bilateral trade on average by some 24 to 38%. In the same manner Dekker et al. (2004), Linders et al. (2005) and Lankhuizen et al. (2008) uncover that a one standard deviation reduction in 'cultural distance' increases the stock of FDI by 16 to 28%. Highly relevant is the assessment of this by De Groot et al. (2004, p. 119) that "good governance lowers the transaction costs for trade between high-income countries, while trade between low-income countries suffers from high insecurity and transaction costs." Typically economic diplomacy can be useful in the context of such market and government failures.

Indeed, our finding of significant and high estimates for embassies and consulates in the trade flows from higher income countries to lower income countries and vice versa is another corroboration of the fact that market failures do exist at least in international trade which justifies the existence of economic diplomacy in order to solve problems related to market failures. We

expect that this phenomenon will become more important over time. The emergence of new economies with very different institutions and cultural background will influence global norms and values and this will undoubtedly have an impact on the rules of international trade and investment. In particular the historical, cultural and institutional background of China and India may in the long run exert an influence on the ways the world defines and settles international conflicts. Typically, the available analyses of low volumes of South–South trade are concerned with infrastructure and trade facilities. Our analysis adds a new element to that discussion, namely the need to establish good political relationship to breed thrust as an important facilitator of mutually beneficial trade.

APPENDIX

Import Destinations of Rose.

In Bold are his exporting countries. The highlighted countries are the 63 exporting and importing countries in the present analysis

Afghanistan	Albania	Algeria (LMIC)	American Samoa
Angola	Argentina (UMIC)	Aruba	Australia (HIC)
Azerbaijan	Antigua & Barbuda	Armenia	Austria (HIC)
Bahamas	Bahrain	Bangladesh (LIC)	Barbados
Belize	Benin	Bhutan	Bosnia & Herz.
Botswana	Brunei Darussalam	Bulgaria (UMIC)	Burkina Faso
Burundi	Belarus (LMIC)	Belgium (HIC)	Bermuda
Bolivia	Brazil (UMIC)	Cambodia	Cameroon
Canada (HIC)	Cape Verde	Central African Rep.	Chad
Chile (UMIC)	China (LMIC)	China, Hong Kong	China, Macao
Comoros	Congo, Dem. Rep.	Costa Rica	Cote D'Ivoire
Croatia	Cuba	Czech Rep. (HIC)	Colombia
Congo, Rep	Cyprus	Denmark (HIC)	Djibouti
Dominica	Dom. Rep. (LMIC)	Ecuador (LMIC)	Egypt (LMIC)
El Salvador	Equatorial Guinea	Eritrea	Estonia
Ethiopia	Faeroe Islands	Falkland Islands	Fiji
Finland (HIC)	France (HIC)	French Polynesia	Gabon
Gambia	Georgia	Germany (HIC)	Gibraltar
Greece (HIC)	Greenland	Grenada	Guam
Guinea-Bissau	Guyana	Ghana	Guatemala
Guinea	Haiti	Honduras	Hungary (UMIC)
Iceland	India (LIC)	Indonesia (LMIC)	Iran (LMIC)
Iraq	Ireland (HIC)	Italy (HIC)	Israel (HIC)
Japan (HIC)	Jordan	Jamaica	Kazakhstan
Kenya (LIC)	Kiribati	Korea (HIC)	Kuwait (HIC)
Kyrgyz Rep.	Laos	Latvia	Lebanon
Lesotho	Liberia	Libya	Luxembourg
Lithuania	Macedonia	Madagascar	Malaysia (UMIC)
Maldives	Malta	Mauritania	Moldova
Morocco (LMIC)	Myanmar	Malawi	Mali
Mauritius	Mexico (UMIC)	Mongolia	Mozambique
Nepal	Netherlands (HIC)	Netherlands Antilles	New Caledonia
Niger	Nigeria (LIC)	North Korea	Norway (HIC)
Namibia	Nauru	New Zealand (HIC)	Nicaragua
Oman	Pakistan (LIC)	Palau	Panama
Papua New Guinea	Paraguay	Peru (LMIC)	Philippines (LMIC)
Poland (UMIC)	Portugal (HIC)	Qatar	Romania (UMIC)
Russia (UMIC)	Rwanda	Samoa	S. Tome & Principe
Saudi Arabia (HIC)	Senegal	Serbia Montenegro	Seychelles
Sierra Leone	Singapore (HIC)	Slovakia	Solomon Islands

Appendix continued

Somalia	South Africa (UMIC)	Spain (HIC)	Sri Lanka
St. Helena	St. Kitts & Nevis	St. Pierre-Miquelon	Suriname
Sweden (HIC)	Switzerland (HIC)	Slovenia	St. Lucia
St. Vincent & Gren.	Sudan (LIC)	Swaziland	Syria
Tajikistan	Tanzania	Togo	Trinidad & Tobago
Tunisia (LMIC)	Turkmenistan	Tuvalu	Thailand (LMIC)
Tonga	Turkey (UMIC)	Uganda (LIC)	Ukraine (LMIC)
Un. Arab Emirates	UK (HIC)	USA (HIC)	Uruguay (UMIC)
Uzbekistan	Vanuatu	Vietnam (LIC)	Venezuela (UMIC)
Wallis-Futuna	Yemen	Zimbabwe	Zambia

REFERENCES

- Afman, E. and M. Maurel, 2010, 'Diplomatic Relations and Trade Reorientation in Transition Countries', in: P.A.G. van Bergeijk and S. Brakman (eds) *The Gravity Model in International Trade: Advances and Applications*. Cambridge University Press (in print).
- Alexander, C. and K. Warwick, 2007, 'Governments, Exports and Growth: Responding to the Challenges and Opportunities of Globalisation' *The World Economy*, pp. 177–94.
- Anderson, J.E. and E. van Wincoop, 2003, 'Gravity with Gravitas, A Solution to the Border Puzzle', *American Economic Review*, 93 (1), pp. 170–92.
- Bergeijk, P.A.G. van, 2009, *Economic Diplomacy and the Geography of International Trade*, Edward Elgar: Cheltenham: UK
- Bergeijk, P.A.G. van and S. Brakman, 2010, 'The come-back of the gravity equation' in P.A.G. van Bergeijk and S. Brakman (eds), *The gravity Equation in International Trade: Advances and Applications*, Cambridge University press: Cambridge (in print)
- Bergstrand, J.H. 1985, 'The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence', *Review of Economics and Statistics*, 67 (1), pp. 474–81.
- Bergstrand, J.H., 1989, 'The Generalized Gravity Equation, Monopolistic Competition, and the Factor-proportions Theory in International Trade', *Review of Economics and Statistics*, 71, pp. 143–52.
- Bikker, J.A., 1987, 'An International Trade Flow Model With Substitution: An Extension of the Gravity Model', *Kyklos*, 40, pp. 315–37.
- Bikker, J.A., 2010, 'An Extended Gravity Model with Substitution Applied to International Trade Flows' in: P.A.G. van Bergeijk and S. Brakman (eds) *The Gravity Model in International Trade: Advances and Applications*. Cambridge University Press (in print).
- Butter, F.A.G. den and R.H.J. Mosch, 2003, 'Trade, Trust and Transaction Costs', *Tinbergen Institute Working Paper No. 2003-082/3*, TI: Amsterdam.
- Cheng, I. H. & Wall, H. J. (2005), 'Controlling for heterogeneity in gravity models of trade and integration' *Federal Reserve Bank of St. Louis Review*, pp. 49–63..
- Coolsaet, R. (2001), 'Historical Patterns in Economic Diplomacy, from Protectionism to Globalisation – The case of Belgium', International Studies Association 2001 Convention.
- Deardorff, A.V., 1995, 'Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World?', *NBER Working Paper W5377* NBER: Cambridge, MA.
- Dekker, P., S. Ederveen, H. de Groot, A. van der Horst, A. Lejour, B. Straathof, H. Vinken and C. Wennekers, 2006, 'Divers Europe', *European Outlook 4*, SDU: The Hague.
- Evenett, S. and W. Keller, 2002, 'On Theories Explaining the Success of the Gravity Equation', *Journal of Political Economy*, 110 (2), pp. 281–316.
- Feenstra, R.C., Markusen, J.R. and Rose, A.K. (2001), 'Using the Gravity Equation to Differentiate among Alternative Theories of Trade', *Canadian Journal of Economics*, 34 (2), pp. 430–47.
- Felipe, J. and M. Vernengo, 2002, 'Demystifying the Principles of Comparative Advantage', *International Journal of Political Economy*, 32 (4), pp. 49–75.

- Gil-Pareja, S., R. Llorca-Vivero and J. A. Martínez-Serrano, 2007, 'The Impact of Embassies and Consulates on Tourism', *Tourism Management*, 28, (2), pp. 355–60.
- Groot, H.L.F. de, G.J. Linders, P. Rietveld and U. Subramanian, 2004, 'The institutional determinants of bilateral trade patterns' *Kyklos* 57 (1), pp. 103–24.
- Guiso, L., P. Sapienza and L. Zingales, 2004, 'Cultural Biases in Economic Exchange', *NBER Working Paper 11005*, Cambridge, MA: NBER.
- Harris, R. and Q.C. Li, 2005, Review of the Literature: The Role of International Trade and Investment in Business Growth and Development, London: DTI.
- Head, K. and J. Ries, 2006, 'Do Trade Missions Increase Trade?', *Saunders School of Business Working Papers*, University of British Columbia.
- Hoekman, B. and B. Smarzynska Javorcik, 2004, 'Policies Facilitating Firm Adjustment to Globalization', *Policy Research Working Paper 3441*, Washington, DC: World Bank.
- Kostecki, M. and O. Naray, 2007, 'Commercial Diplomacy and International Business', *Discussion Papers in Diplomacy*, Netherlands Institute of International Relations 'Clingendael': The Hague.
- Krauthaim, S., 2007, 'Gravity and Information: Heterogeneous Firms, Exporter Networks and the "Distance Puzzle"', *Mimeo.*, Florence: European University Institute.
- Lankhuizen, M., G.J. Linders and H.L.F. de Groot, 2008, 'Distance and the Mode of Serving Markets', *TI Discussion paper [in print]*, TI: Amsterdam.
- Lederman, D., M. Olarreaga and L. Lucy Payton, 2006, 'Export Promotion Agencies: What Works and What Doesn't?', *World Bank Policy Research Working Paper 4044*, Washington, DC: World Bank.
- Linders, G.-J., H.L.F. de Groot and P. Nijkamp, 2004, 'Locality Matters: Myths and Facts on the New Economy', in J. Poot (ed.), *On the Edge of the Global Economy*, Edward Elgar: Cheltenham, UK, pp. 27–48.
- Linders, G.-J., A. Slangen, H.L.F. de Groot and S. Beugelsdijks, 2005, 'Cultural and Institutional Determinants of Bilateral Trade Flows', *Tinbergen Discussion Paper, TI2005-074/3*, TI: Amsterdam and Rotterdam.
- Linnemann, H., 1966, *An Econometric Study of International Trade Flows*, Amsterdam: North Holland.
- Marrewijk, C. van and P.A.G. van Bergeijk, 1993, 'Endogenous Trade Uncertainty: Why Countries May Specialize Against Comparative Advantage', *Regional Science and Urban Economics*, 23 (4), pp. 681–94.
- Nitsch, V., 2007, 'State Visits and International Trade', *World Economy* 30 (4), pp. 1797–816.
- Piermartini, R. and R. The, 2005, 'Demystifying Modelling Methods for Trade Policy', *WTO Discussion papers 10*, Geneva: WTO.
- Pollins, B.M., 1989, 'Conflict, Cooperation and Commerce', *American Journal of Political Science*, 33, pp. 737–61.
- Ricardo, D., 1962, *The Principles of Political Economy and Taxation*, London: Everyman's Library (first published in 1817).
- Rose, A., 2007, 'The Foreign Service and Foreign Trade: Embassies as Export Promotion', *The World Economy*, 30 (1), January, pp. 22–38.
- Saner, R. and L. Yiu, 2003, 'International Economic Diplomacy: Mutations in Post-Modern Times', *Discussion Papers in Diplomacy no. 84*, Netherlands Institute of International Relations 'Clingendael', The Hague.

- Segura-Cayuela, R. and J.M. Vilarrubia, 2008, 'The Effects of Foreign Service on Trade Volumes and Trade Partners', *Working paper 0808*, Banco de España: Madrid.
- Summary, R.M., 1989, 'A Political-Economic Model of U.S. Bilateral Trade', *Review of Economics and Statistics*, 71 (1), pp. 179–82.
- Tinbergen, J., 1962, *Shaping the World Economy* – Suggestions for an International Economic Policy, Twentieth Century Fund: New York.